Claims

1. A power conversion apparatus for converting power from an alternating source to dc, comprising:

an input stage for receiving power from the alternating source, which input stage includes an input filter,

rectifying means for rectifying the alternating signal,

a capacitor for storing energy from the rectified signal,

an output for outputting power from the rectifying means and the capacitor to the pulsed load,

wherein the pulsed load has at least one switched winding which receives power from the output, and wherein the capacitor is dimensioned such that the voltage across the capacitor falls below 15% of the nominal peak rectified voltage of the source during each cycle of the alternating source.

2. A power conversion apparatus according to claim 1, wherein the capacitor is dimensioned such that the voltage across the capacitor falls below 10% of the nominal peak rectified voltage of the source during each cycle of the alternating source.

3. A power conversion apparatus according to claim 1 or 2, wherein the capacitor is dimensioned such that the voltage across the capacitor falls below 5% of the nominal peak rectified voltage of the source during each cycle of the alternating source.

4. A power conversion apparatus according to any one of the preceding claims, wherein the capacitor is dimensioned to store the amount of energy which is released from the winding when the winding is switched off.

5. A power conversion apparatus according to any one of the preceding claims, wherein the pulsed load has a switching frequency which is greater than 2KHz.

6. A power conversion apparatus substantially as hereinbefore described with reference to any one of the embodiments shown in Figures 11 to 24 and 26 of the accompanying drawings.

7. An electrical apparatus comprising a power conversion apparatus according to any one of the preceding claims and a pulsed load.

8. An electrical apparatus according to claim 7, wherein the pulsed load is an inductive load which is repeatedly switched between an on state and an off state, wherein the duration of the on state is less than the off state so as to minimise or avoid flux build up in the inductive load.

9. An electrical apparatus according to claim 7 or 8, wherein the pulsed load comprises a motor having at least one switched phase winding.

10. An electrical apparatus according to claim 9, wherein the motor is a switched reluctance motor.

11. An electrical apparatus according to claim 9 or 10, further comprising an impeller which is driven by the motor.

12. An electrical apparatus according to claim 11 in the form of a vacuum cleaner with an airflow path, wherein the impeller is a suction fan for drawing air along the airflow path.

13. An electrical apparatus according to claim 9 or 10, further comprising a surface-treating device which is driven by the motor.

14. An electrical apparatus according to claim 13, in which the surface-treating device comprises an agitator which is rotatable by the motor.

15. An electrical apparatus according to claim 14 in the form of a vacuum cleaner, wherein the agitator is located in the cleaner head or floor tool.

16. An electrical apparatus according to claim 7 or 8, wherein the pulsed load is a power supply, and the switched winding comprises a transformer.

17. An electrical apparatus, substantially as hereinbefore described, with reference to, or as illustrated in, any one of the embodiments shown in Figures 11 to 24 and 26 to 28 of the accompanying drawings.